

A Review of Latent Fingerprint Developed Powder from using Natural Materials

Krushnai. J. Parkale, Manjushri. S. Bagul

Department of Forensic Science, Yashavantrao Chavan Institute of Science (Autonomous), Satara, Maharashtra, India

ARTICLE INFO

Article History:

Accepted: 12 April 2024

Published: 22 April 2024

Publication Issue :

Volume 11, Issue 2

March-April-2024

Page Number :

715-717

ABSTRACT

The fingerprint development technique is one of the oldest methods used in forensic science and is a common method of identifying perpetrators. [1] Different powder methods have been accounted for the development of latent fingerprints on various surfaces in the literature, such as lead, titanium oxide, Rhodamine B dye etc., all powders mentioned had been used for the development of latent fingerprints. Some of these methods using powders when exposed to humans, may lead to health problems, and also these methods are expensive in nature [2]. Various fingerprint powder preparations used for fingerprints have a color or contrast and a sticky material for good adhesion [3]. The goal of this review is to compile the research works done by various experts to identify commonly available, everyday materials as fingerprint powders such materials from various categories such as food powders, plant materials, minerals, cosmetics, carbon-based materials, and miscellaneous powders [1]. The powder method is a quick and easy approach to the development of latent fingerprints on porous and nonporous surface [4]. proposing a new powder method, which is simple, nontoxic to human health, cheap in nature, and as well can be utilized for the development of latent fingerprints on various contrast surfaces [2].

Keywords : Fingerprint, Natural Powder, Porous Surface, Non Porous Surface.

I. INTRODUCTION

In forensic investigations, the relationship between the criminal, the victim, and the crime scene can be firmly established through the detection of latent finger marks. Fingerprints are avital and unique

identity of a person. These are impressions left by the friction ridges of a human finger on contact with any surface. Many unique characteristics in the human body like a fingerprint, DNA, palm prints, iris patterns, voices, etc. So, Fingerprint is a unique characteristic of the human body, and every human's

different fingerprints between identical twins [5]. Fingerprints found at crime scene are important as valuable evidence. Fingerprint identification, can be referred to as individualization, identifies individualized patterns that can be used to confirm or reject the association of a suspect with objects found at a crime scene [6].

In general, the three fingerprint traces found at a crime scene are visible (patent print), an impression (plastic mould), and latent print [3]

Based on Locard's exchange principle as "Every contact leaves traces" the latent fingerprint is the most encountered print from the crime scene [5]. Latent fingerprints are most generally seen prints from the crime scene. Such prints are obtained when natural oils and perspiration existing between the fingertip ridges are transferred to a surface by any contact. Latent prints are invisible and are much harder to detect and preserve [5]. The efficiency of developing latent fingerprints with a fingerprint powder is determined by several factors, including particle morphology (small and fine particles adhere more easily than large and coarse particles), age of the fingerprint under investigation (the liquid content of the fingerprint residue decreases with time, reducing powder adsorption), ambient conditions such as temperature (elevated temperature and low pressure produce similar effects observed for aged fingerprints), the colour (colour of the fingerprint powder should be selected keeping the colour of the surface in mind in order to develop the latent fingerprints with good contrast) and nature of the surface (non-porous, non-textured surfaces are easy to handle than porous, textured surfaces) on which the latent fingerprint is deposited [1]. The use of fingerprint powders as a developing technique dates back to the early nineteenth century [7]. The use of black chemical and magnetic powder for old fingerprint enhancement had been questioned as it is usually used for latent or new fingerprint. Universally, there are four methods

of fingerprint powder, namely ordinary, Luminous, metallic and thermoplastic [8]. The objective of the study is to provide a replacement to the conventional, expensive and toxic laboratory powders [4]. These organic powders are easily available, eco-friendly, cost-effective and non-toxic approach for latent fingerprint development and is a reliable technique to use at crime scene and future use [9].

II. METHODS AND MATERIAL

We divided the common everyday materials applied for the detection of latent fingerprints, food materials and food additive, plant materials, cosmetics, minerals, carbon-based material and miscellaneous. The common everyday materials also used for making powder for developed fingerprint.

The method was performed to produce fingerprint powder from natural materials like plants, flowers, leaves, etc. The latent fingerprint are clearly visible by natural rigid powder. This method used on non-porous surface.

III. CONCLUSION

The latent fingerprint development powder using different powders made from natural materials gives a good result. Natural powder visible on both porous and non-porous surface.

IV. REFERENCES

- [1]. M. N. b. K. A. c. Ramanan Vadivel, "Commonly available, everyday materials as non-conventional powders for the visualization of latent fingerprints," ScienceDirect, 2021.
- [2]. M. N. B. Dinesh Baban Kambl, "A NEW POWDER METHOD FOR DEVELOPMENT OF LATENT FINGERPRINT", ResearchGate, 2018.
- [3]. A. N. S. L. Sri Adelila Sari, "THE DEVELOPMENT OF DUSTING METHOD FOR

DRAGON,” JKPK (JURNAL KIMIA DAN PENDIDIKAN KIMIA, 2021.

- [4]. V. A. a. V. G. a. Sneha Lohar a, “Comparative study of development of latent fingerprint by using cost effective waste materials,” ScienceDirect, 2022.
- [5]. R. Mia, V. Panchal¹, P. Dangi² and Chanchal, “Latent Fingerprint Development by Brick Powder,” Austin Journal of Forensic Science and Criminology, 2023.
- [6]. L. E. MUHAMMAD YUSOF OMAR, “Possibility of Using Fingerprint Powders for Development of Old Fingerprints,” ResearchGate, 2012.
- [7]. D. H. N. Sri Adelila Sari, “Development of Nail Henna (Lawsonia Inermis Linn.) Leaf Powder as a Latent Fingerprint Visualization on Non-Porous and Porous Surfaces,” Journal of Medicinal and Chemical Science , 2023.
- [8]. V. A. Vanisha Godara, “food materials and food additive, plant materials, cosmetics, minerals, carbon-based material and,” ejournals, 2024.
- [9]. I. H. A. H. J. Y. S. J. N. Sungwook Hong, “A new method of artificial latent fingerprint creation using artificial sweat and inkjet printer,” ScienceDirect, pp. 403-408, 2015.
- [10]. M. S. Nur Fatin Zulkifli, “Development of Natural Latent Fingerprint Powder from Durian Seeds - A Green and Effective Approach in Crime Scene,” ResearchGate, 2017.
- [11]. H. K. R. K. Rakesh K. Garg, “A new technique for visualization of latent fingerprints on various surfaces using powder from turmeric: A rhizomatous herbaceous plant (Curcuma longa),” ScienceDirect, pp. 53-57, 2011.